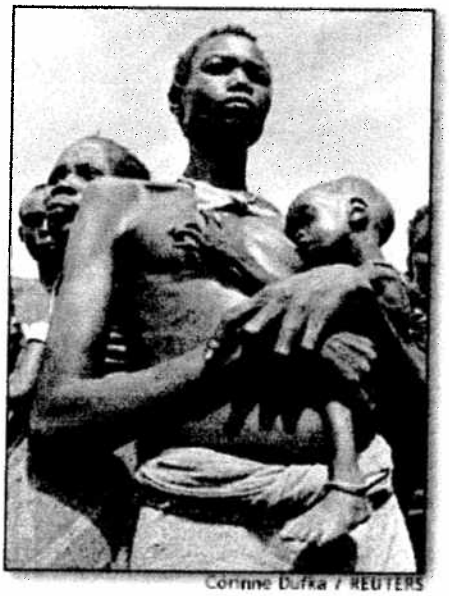


Corinne Dufka / REUTERS

My name is Mary Hamilton. And this is Angela Hickey. Her daughter died from drug induced egg harvesting - the same process fundamental to this bill.

Let's not pretend this is about "clinic embryos that would just be thrown away". Clinics produce few extra embryos and they don't come from nuclear transfer - but by putting a women through a potentially life-threatening procedure.

This risk should be a primary consideration, even over patient's hopes and scientist's dreams. This bill provides few embryos not already available under current Michigan law with federal funding.

Embryos are not frozen for decades, but continuously used and renewed. In one year a clinic may have 1663 embryos frozen and thaw 1641 (1).

In the average US IVF cycle:

8	6-8 eggs are harvested (2)
5	60% are successfully fertilized (3)
2-3	50% stop growing and become 'naturally dead' (4)
2-3	Implanted (5)

There's rarely extra embryos. 2/3rds of the time there's no baby. Any extras are stored for future attempts.

The study from which '400,000' comes concludes that if ALL research designated embryos were used exclusively to produce stem cells, less than 6/state might. (6)

Comparing the '400,000 embryos' study with CDC numbers, Michigan can expect zero new embryos annually ... to 10 decimal places.

Virtually all those 'thrown away' have stopped growing. These dead embryos produce normal stem cells at the same rate as other 'fresh' embryos. (7) Tens of thousands arrest annually, and the NIH announced plans to federally funding research with them in September (8).

Michigan law prohibits research on living embryos, not those 'naturally dead'.

And soon, there may be no 'extra' embryos. Drug induced mass stimulation is old technology. Natural cycle egg retrieval produces healthier babies at 1/2-1/3 the cost while minimizing their patient's health risks. (9)

And the risks are significant. They include thromboembolic events, pulmonary embolisms and infarctions, (stroke), arterial occlusion with loss of a limb, increased risk of clotting disorders, kidney damage, brain damage, paraplegia, infertility, (10) and, as Mrs. Hickey will tell you - death.

The few long-term studies link stimulation drugs with and an increased risk of ovarian cancer, heart and kidney diseases in the mother, and cancers, deformities, and stillbirth in her future offspring. (11)

These risks should not be incurred by donor who will not benefit by the research, particularly for SCNT.

Therapeutic use of ntESC is a myth. Published animal trials are of failures. (12) Clones cannot read or translate genes properly (13), And your clone can't travel with you.

Outside of curiosity, SCNT is old news. This March, Nature Genetics pointed out that reprogramming somatic cells to the pluripotent state "is a much easier method than [nuclear transfer embryonic stem cell] derivation". (14) Perfectly matched to patient. Researchers can study conditions from early stages. Federally funded. Minimal risk and only to those who may benefit directly from the research.

And, from where will ntEmbryos come? Over decade of attempts indicate SCNT won't work in humans due to biological issues unique to them. (15)

And the eggs?

The National Academy of Sciences estimated individualized SCNT therapy costs to be $100,000 - $200,000 per patient for the human eggs alone, (16) it's extremely inefficient. Statistically, for each person treated a woman would suffer serious long-term health consequences.

Harvard spent $100,000 trying to recruit egg donors for SCNT, over a year later no one offered. The risks were too high. (17)

Historically, governments that rely on clinic embryos soon end up paying women for eggs. Institutions are turning to egg brokers who lure poor women around the world by offering several month's wages (about $250), severely overproduce eggs, and then cast them aside as the complications arise. (18)

Conveniently, these cost efficient women can 'diversify the population' of the current 'rich white women' derived stem cell lines.

Don't base your decisions on speculation, old research, and 'we just don't know', because today we do know that most berashis (19) and many adult stem cells are pluripotent (20), and you can induce pluripotency easier than you can clone. How can embryonic stem cells be therapeutically superior to other stem cells, when they have to mature THROUGH those stages to be therapeutically useful?

The number of human clinical trials recruiting using stem cells is nearing 1000, but

ClinicalTrials.gov lists only 2 for embryonic (21) ... and those are only to try to make new lines. Embryonic stem cells are unlikely candidates for therapy because they form tumors and are rejected by the subject.

Embryonic stem cells have been studied for over half a century, yet therapeutically trail stem cells identified in just the last few years.

But, even if there were results ... should poor women exploited and be seriously injured or die to provide provide a 'cure' for the rich?

Women's reproductive capabilities are a unique commodity for the biotech industry.

There is clear conflict of interest when the same institutions that determine how much to stimulate the woman and consults them what to do with any extras also stands to profit from those same embryos.

Current Michigan law is consistent with the World Medical Associations Declaration of Geneva for both the embryos and women who won't benefit from the research - as well as the UN's request for a moritorium on all forms of cloning specifically to protect women from exploitation. It should not change for such insignificant additional numbers.

Recent advances in technology and federal law strike any meaningful reason for this bill. Hopes, dreams, and just wanting to know is not compelling enough to compromise women's health.

End Notes (Citation format not perfect)

1 "Fate of Surplus Embryos", Newsday, Oct. 1, 2007, pg. D11

3-5 2004 CDC ART Report

6 Hoffman, David I."Cryopreserved Embryos in the United States and their Availability for Research", *Fertility and Sterility*, Vol. 75, No. 5, 2003, p. 1063-1067.

7 Zhang, X., P. Stojkovic, et al., *Derivation of human embryonic stem cells from developing and arrested embryos*, *Stem Cells* 2006;24;2669-2676; originally published online Sep 21, 2006;

8 *NIH Announces Plan to Implement President's Stem Cell Executive Order*. Press

9 *Treatments for IVF are needlessly aggressive and risky, says report*, The Independent (London), Marcy 2, 2007, p. 8 [among others]

10 Letter from Suzanne Parisian, M.D., a former Chief Medical Officer for the FDA regarding "the manner in which eggs will be extracted from healthy women donors."

11 Steigenga, Marc J., et. Al, *Evolutionary conserved structures as indicators of medical risks: increased incidence of cervical ribs after ovarian hyperstimulation in*

12 Cloning & Stem Cells, 7, 96-106 July 2005 [among others]

13 Scientists generally agree that *all cloned animals are biologically flawed.* "Epigenetic Reprogramming in Mammalian Development", *SCIENCE* V. 293 10 Aug 2001, p. 1098 makes it clear that: Cloned animals have unpredictable problems with gene expression. Animals with the same genotype do not have the same phenotype; This problem is heightened with embryonic stem cells; This problem is neither predictable and can be triggered throughout the life of the cloned organism.

Sugaya, Kiminobu (Personal Communication, January 6, 2003). "Fundamental problem with the cloning is based on the metylation of DNA. Why our body cell has exact same genetic materials, but they become different type of cells? This is because of gene regulation by DNA metylaltion, which is a kind of memory of the cells.

If we put nuclei isolated from skin or other cells to the egg, it contains memory to become skin some extent.
So, it may not develop into the normal embryo to generate stem cells. Now we are working on the adult bone marrow stem cells to make neurons and retinal cells. It is promising and we will continue this direction."

Wilmut, Ian (Personal Communication, February 13, 2003) "data seems to say that for any given clone, any given gene, the chance of being expressed is random. Seems to be no consistency between clones."
Dr. Jean D. Peduzzi-Nelson, Ph.D. Senate Testimony, July 14, 2004. "It often stated that there is no chance of human reproductive cloning because 99.2% of cloned embryos can not survive. However, these same faulty cloned embryos are being praised as being a source of valuable stem cells that will advance the cure of genetic disorders. If these cloned human embryos are so abnormal that they almost never can survive in the womb then stem cells derived from them would also abnormal and not useful for research."

Op. Cit., Wilmut, Ian. Cloning not intended for therapy Dr. Wilmut wants to use them primarily "to produce neural populations from patients with motor neurone disease in order to be able to have in the lab the damaged cells for study, to test new drugs and to assess the effect of normal cells. Secondly to produce hepatocytes of different genotypes to study responses to drugs as a means of improving both safety and effectiveness of medicines." [Note, Not to "put the products back into a patient".]

"Embryonic Stem Cells Accrue Genetic Changes", *Johns Hopkin's Medicine* (September

14 "Nuclear reprogramming of cloned embryos and its implications for therapeutic cloning", Nature Genetics, V. 39, No. 3, March 2007, p. 301

15 Human cloning unlikely Primate NT appears to be challenged by stricter molecular requirements for mitotic spindle assembly than in other mammals. In cattle, the somatic centrosome is transferred during NT, whereas mice rely on the oocyte's maternal centrosome. Also, NuMA and HSET are not exclusively concentrated on the meiotic spindle in mammals other than primates. With current approaches, NT to produce embryonic stem cells in nonhuman primates may prove difficult--and reproductive cloning unachievable. " (Science 11 April 2003: 297)

16 "A Progressive Position on Stem Cell Research", Clamor, Bowling Green, Fall 2006, Iss. 38, pg. 69

17 Dr. Kevin Eggan, Stem Cell Summit, Boston,

18 Presentation at CORE European seminar, 30 June, 05

19 Endless work by Dr. Norman Ende, et. Al. showing that stem cells from extra embryonic tissue produce tissues from all 3 germ layers. ; 31 "Cells from amniotic fluid used to tissue-engineer a new trachea" *EurekAlert* (October 8, 2005)

fluid may hold ethical stem cells , *New Scientist* (June 3, 2005) Journal reference: *Human*

20 Some include: "Stem Cell Research; Data Show Hair Follicle Stem Cells Rival Embryonic Stem Cells in Regenerative Potential", *Gene Therapy Weekly* (January 26,

"Stem Cell Media Advisory: Leaders in Adult Stem Cells Derived from Fat to Hold News

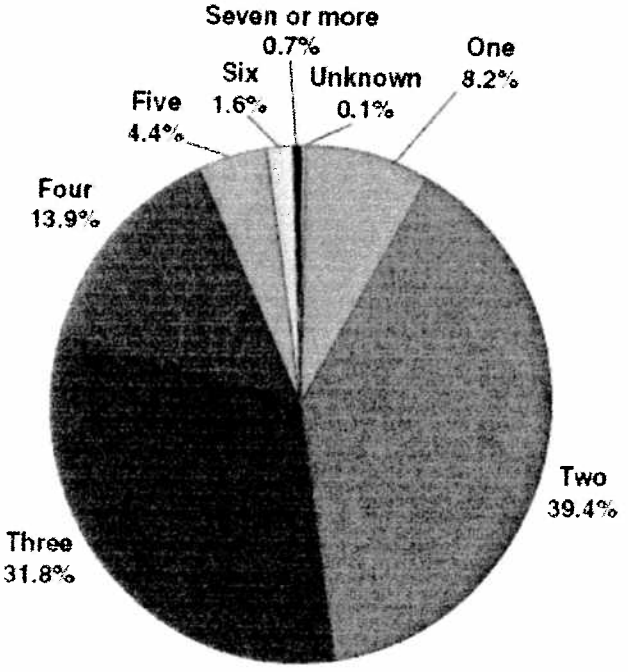
"Japanese Scientists Discover Fast-growing Stem Cell" *Daily Yomiuri* (March 11, 2006)

Specifically: Moraga Biotechnology Corporation, Los Angeles, California adult stem cell research company, has announced that they have discovered a primitive stem cell that is very similar to embryonic stem cells. Researchers at Moraga have discovered that these adult stem cells can differentiate into nearly any type of tissue or organs. Notable in this is that these stem cells can actually differentiate into spermatogonia. These stem cells are widespread throughout the body and appear to be retained in adult tissues as "Blastomere-Like Stem Cells (BLSCs) " FROM: "Stem Cell Research Quickie - New Adult Stem Cell

Angela Hickey's daughter is among those who died as a result of drug induced egg harvesting.

Charts from 2004 CDC ART Report

Figure 29
Number of Embryos Transferred During ART Cycles Using Fresh Nondonor Eggs or Embryos,* 2004



* Total does not equal 100% due to rounding.

Figure 15
Outcomes of ART Cycles Using Fresh Nondonor Eggs or Embryos, by Stage and Age Group, 2004

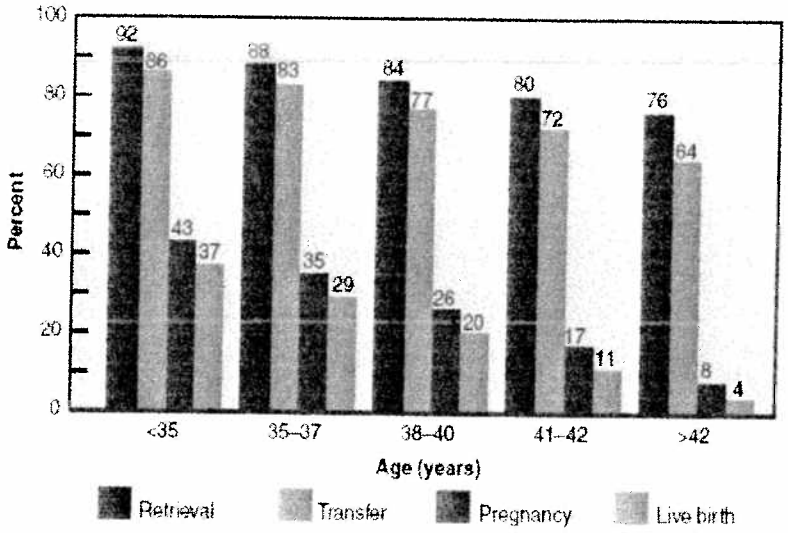
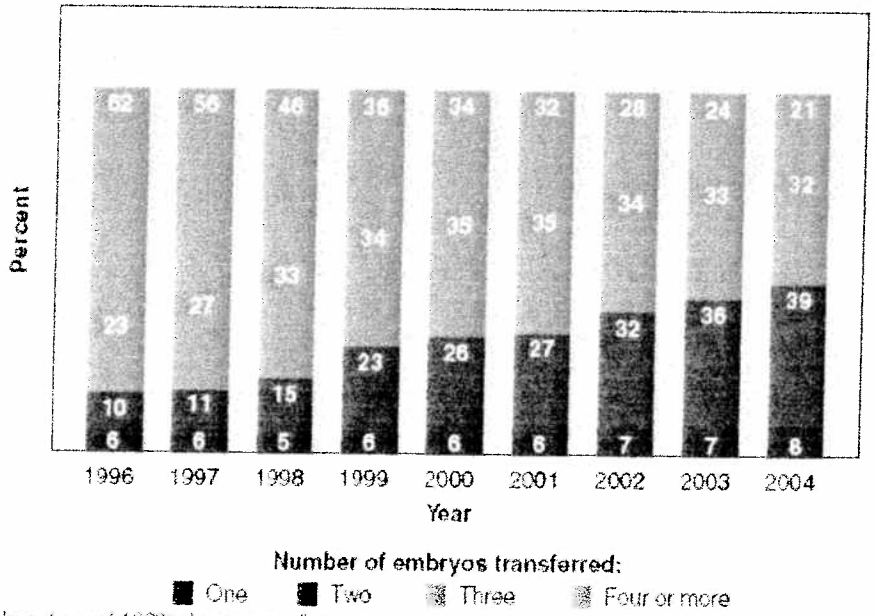


Figure 50
Percentage of Fresh–Nondonor Cycles That Involved the Transfer of One, Two, Three, or Four or More Embryos,* 1996–2004

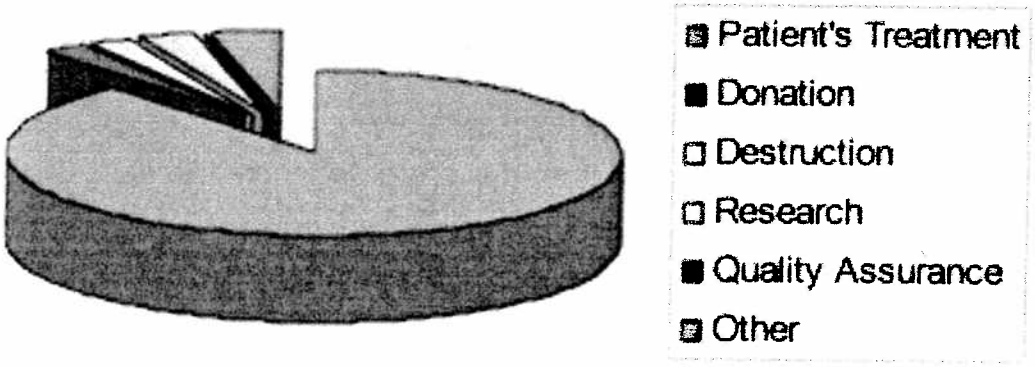


*Totals do not equal 100% due to rounding.

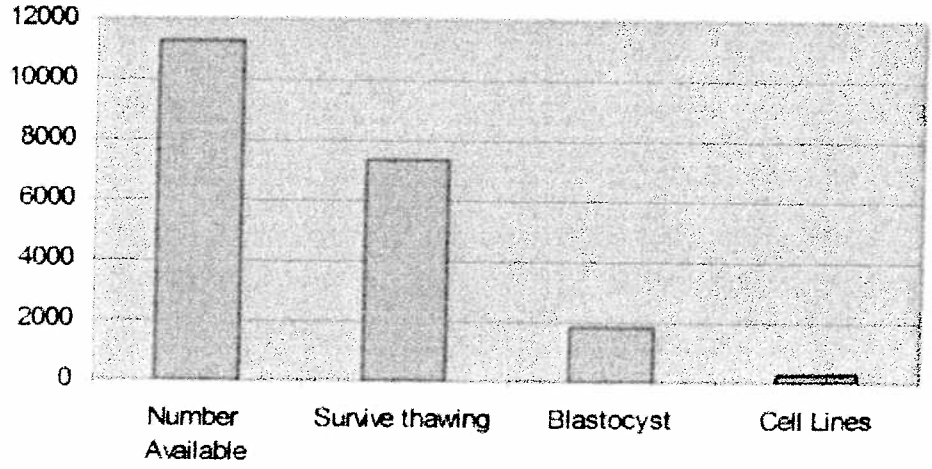
Charts representing numbers from

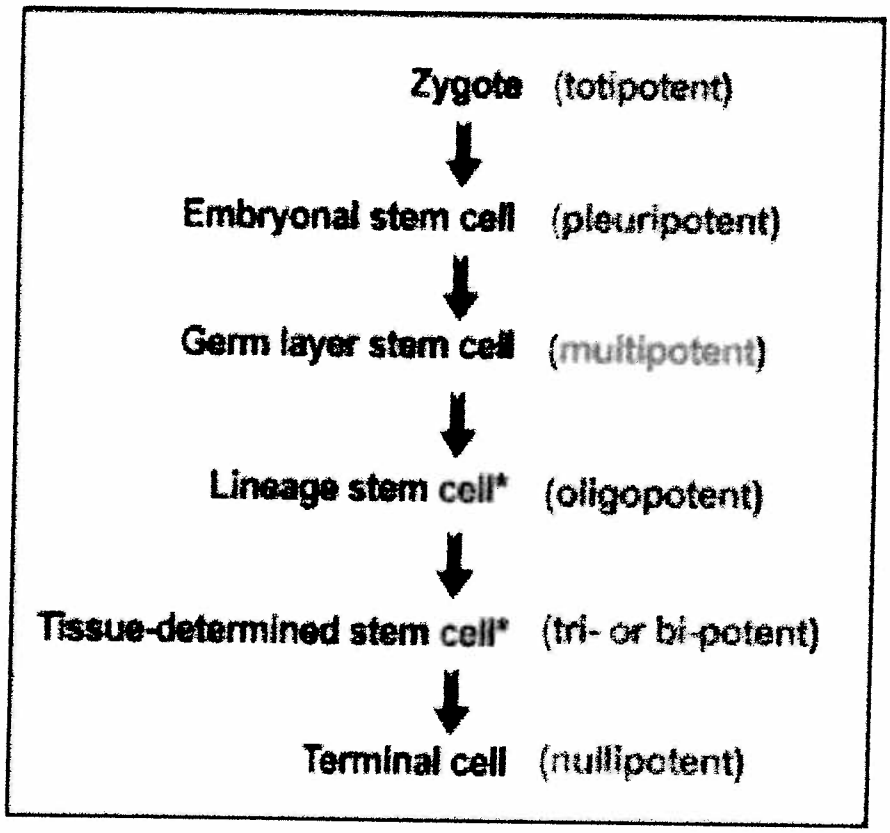
Hoffman, David I."Cryopreserved Embryos in the United States and their Availability for Research", *Fertility and Sterility*, Vol. 75, No. 5, 2003, p. 1063-1067.
http://www.asrm.org/Professionals/Fertility&Sterility/cryoembryos_may2003.pdf

How patients designate stored embryos



Conversion of embryos to stem cell lines




Zygote (totipotent)
Embryonal stem cell (pleuripotent)
Germ layer stem cell (multipotent)
Lineage stem cell* (oligopotent)
Tissue-determined stem cell* (tri- or bi-potent)
Terminal cell (nullipotent)